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東京大学理学部 1 号館西棟 11 階 1109 号室 (天文学専攻会議室) にて

“Fast Radio Transients with MeerKAT”

Richard Armstrong (Univ. Oxford/Univ. Cape Town)

Extreme astrophysical phenomena, such as relativistic flows, cataclysmic explosions and all types of accretion onto black holes, are a key area for astrophysics in the 21st century. The extremes of physics, density, temperature, pressure, velocity, gravitational and magnetic fields experienced in these environments are beyond anything achievable experimentally on Earth, and provide a unique glimpse of the laws of physics operating in extraordinary regimes. Nearly all such phenomena are associated with transient radio emission, a tracer of the acceleration of particles to relativistic energies by their interaction with the local magnetic field. However, in order to probe the dynamic radio sky, we have thus far relied on 1.) biased triggers from instruments at other wavelengths, and 2.) archival searches of data, obviating the possibility of multi-wavelength follow-up and classification to resolve the inevitable ambiguities.

MeerKAT, which will be the world's most sensitive radio telescope once science operations begin at the end of next year, enables an unrivalled view of the deep radio sky. Yet it will also push the boundaries of transient searches in both temporal resolution (cadence of images) and completeness (time-on-sky); in this talk, I will discuss my own project, the fast imaging system for MeerKAT, which will detect transient radio emission in real-time, and will operate commensally with all other science observations, allowing MeerKAT to be unprecedentedly sensitive to extreme phenomena.